



Using the UN Biodiversity Lab to Support National Conservation and Sustainable Development Goals
March 24 - April 7

Questions & Answers Part 3

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Amber Mccullum

(amberjean.mccullum@nasa.gov), Juan Torres-Pérez (juan.l.torresperez@nasa.gov), Scott Atkinson (scott.atkinson@undp.org) or Annie Virnig (anne.virnig@undp.org).

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NASA ARSET webinar series & certificates

Question 1: I wanted to see if after each session you give confirmation of participation by mail as it was done in other courses, since I have not received any notification from previous sessions.

Answer 1: Due to the volume of people taking the course, the certificate will only be sent to those who complete the task at the end of the course. If you logged into the sessions, the software collected that information.

Question 2: Greetings, I would like to know if I can get my certificate even if I have not attended the previous training but I have already seen the recording and I am willing to do the exercises after this webinar.



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Answer 2: Yes. You can obtain the certificate after completing the homework assignment. Remember that you have until April 21 to complete the assignment, and it takes about two months to receive the certificate.

Question 3: Good afternoon, I wanted to know if there's a course on how to get satellite images from maps such as the human footprint.

Answer 3: We have many ARSET webinars on the use of remote sensing data for land management. You can view the recordings and get free materials online on the ARSET website. Here are some examples:

- Fundamentals of remote sensing
- Land cover classification
- Change detection
- Accuracy assessment
- Time series analysis

Technical Questions about Using UN Biodiversity Lab

Question 4: I was wondering if it is possible to download shapefiles from the Biodiversity Lab to be used on ArcGIS or other platforms (with credit of course)?

Answer 4: Most spatial data in the UN Biodiversity Lab can be exported into many standard GIS formats, including Geopackages, ESRI Shapefiles, Geojson, etc. However there are some datasets that we are not allowed to permit the downloading of, per our data use agreements with the data providers.

In last week's webinar, we discuss the exact process for downloading shapefiles from the UN Biodiversity Lab. You can access both the presentation and the recording on the [NASA ARSET webinar page](#). Alternatively, you can see this in our UN Biodiversity Lab downloadable user guide, available [here](#). Please note that while you can easily download vector data, the process is slightly more complicated for raster data. If you are interested in downloading raster data, please contact Scott Atkinson (scott.atkinson@undp.org).

Question 5: The password from the MapX bot is only allowing me to stay signed in for 20 minutes, and I then need to request a new password. Is there a way to ensure that I stay logged in for longer?



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Answer 5: You should only need to request the password to your email and enter it once every few weeks. If this issue persists, please contact Scott Atkinson (scott.atkinson@undp.org).

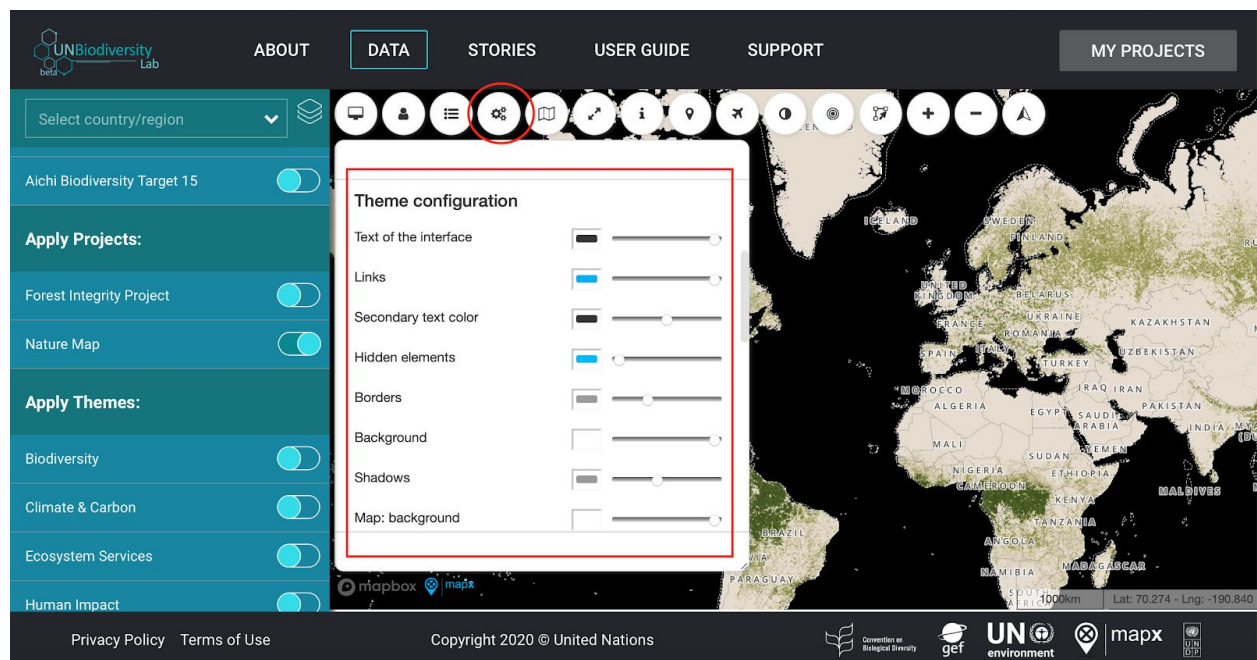
Question 6: Excellent presentation. On UN Biodiversity Lab, I cannot find Puerto Rico on the dropdown menu. Can you help me to find it?

Answer 6: Thank you for your question. This is because Puerto Rico is a territory in the United States. The US is not a GEF-eligible country, and therefore did not receive our support through the 6NR project. This is why Puerto Rico does not have a national project and is not listed with other countries.

However, it is possible to use the public website and have access to all the data still! You can zoom in Puerto Rico and play around with the data layers. If you have a more specific question, please do not hesitate to be in touch with Scott Atkinson (scott.atkinson@undp.org).

Question 7: Are the color codes on UN Biodiversity Lab standard or is each country able to apply its own codes?

Answer 7: The styling for all of the data already available on UN Biodiversity Lab are consistent, however, you can adjust the transparency and styling using the Toolbox.





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If you are a publisher or administrator in your country's National Project, you have the ability to upload national data layers to your National Project. When you upload these data, you can set the styling. We did not include instructions for uploading as part of this training, as public users do not have the ability to upload data. If you are interested in learning more about uploading data to your National Project, please contact Scott Atkinson (scott.atkinson@undp.org) and Annie Virnig (anne.virnig@undp.org).

Data Available on UN Biodiversity Lab

Question 8: What is the difference between UN Biodiversity Lab and Nature Map?

Answer 8: The Nature Map initiative is developing an integrated global map of biodiversity, carbon storage, and other dimensions of nature by consolidating and crowd-sourcing data from many sources.

The draft versions of these maps are available on UN Biodiversity Lab. Simply click the 'Nature Map' toggle, and then select the layer you would like to see. We are actively working with the Nature Map team to explore how maps of ecosystem services can support countries to meet their nature, climate, and sustainable development priorities.



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Question 9: Does the Human Footprint show where biodiversity is most affected? Is the data for Human Footprint standardized at a global level or is there standardized data at the national level, specifically in the case of Costa Rica?

Answer 9: The Human Footprint (HFP) provides a measure of direct and indirect human pressures on the environment globally in 1993 and 2009. It is derived from information from remote surveys and from remote sensors compiled into eight measured variables. This represents not only the most up-to-date information of its kind, but also the first temporarily consistent set of Human Footprint maps. Data on human pressures were acquired or developed for: 1) built environments, 2) population density, 3) electrical infrastructure, 4) farmland, 5) grazing land, 6) roads, 7) railways, and 8) waterways.

In the case of **Costa Rica**, the idea is to standardize at the national level with global data for the continuity of the information. The greatest impact will always be influence on the infrastructure around sensitive ecosystems.

Question 10: Regarding the impacts of the human footprint, can the data from previous years be viewed?

Answer 10: The human footprint is available for the years 1993, 2000, 2009, and 2013. For more information on the human footprint and other data products released through the NASA Forest Integrity Project, please see our project brochure, available in [English](#), [French](#), and [Spanish](#).

Question 11: How can data be obtained at the local level? As in, at the national level, state level, and city level?

Answer 11: The data available on **UN Biodiversity Lab** are global datasets - they cover an entire country. What we try to do with UN Biodiversity Lab, and specifically with national private spaces, is to ensure communication among relevant national stakeholders in a given country. This is also why we have this specific feature of uploading national datasets, which are often more precise and up-to-date. Therefore, to have data at a more local level, we recommend engaging and communicating with data providers that could have such data and include them in the private project on UN Biodiversity Lab, and upload existing data.

In **Colombia** there are several institutions that generate and publish data at the regional and local levels. The national environmental information system (SINA) tries to



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compile this official information for Colombia. You can check the available resources [here](#).

In **Costa Rica** you can go to the following links of national institutions to consult or download information from local data: National Geographic Institute ([SNIT](#)), National Center for Geoenvironmental Information ([CENIGA](#)).

Question 12: Are there layers on illegal mining at the UN Biodiversity Lab?

Answer 12: Unfortunately we do not have this data on UN Biodiversity Lab.

Question 13: For the characterization of Hydrographic Basins, the level curves are essential. What tool does the UN Biodiversity Lab provide us, to have access to the level curves of a basin under study?

Answer 13: Unfortunately we do not have this data on UN Biodiversity Lab.

Question 14: Can satellite images be downloaded from the UN Biodiversity Lab platform?

Answer 14: We offer satellite base maps from Bing. Further, the satellite data available on the site are only RGB baselayer tiles of the satellite data. They are not the multi-spectral remotely sensed data that is what is useful for remote sensing analyses. In most cases users can access these same layers from the same providers in Desktop GIS software (note that 'normal' use is typically within the free allocation - higher usage does typically require a fee per use). QGIS can be used to pull in RS tiles for example.

Question 15: How is human footprint calculated on a global level? How is the authenticity of the data?

Answer 15: The Human Footprint is calculated on a global level by aggregating eight globally consistent human pressure datasets: built environment, population density, electric infrastructure, croplands, pasture lands, railways, roadways, and navigable waterways. The resulting data quantifies human pressure, and changes in human pressure over time, on ecosystems around the world.

The data was validated by using high resolution satellite imagery (median=0.5 m) overlaid with 3,560 random sampling points located across the Earth's non-Antarctic land areas. 344 uncertain points were eliminated, leaving 3,116 validation points.



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For more information see, the peer reviewed publication of the Human Footprint update:

Venter, O., Sanderson, E.W., Magrath, A., Allan, J.R., Beher, J., Jones, K.R., Possingham, H.P., Laurance, W.F., Wood, P., Fekete, B.M., Levy, M.A., Watson, J.E.M., 2016. Sixteen years of change in the global terrestrial human footprint and implications for biodiversity conservation. Nature Communications 7, 12558.

<https://doi.org/10.1038/ncomms12558>

Question 16: For human footprints or population density rasters, where do I find the min/max rendering setting for the pseudocolor band rendering for the rasters?

Answer 16: There is currently no functionality to alter the data and style rendering of raster data in UN Biodiversity Lab.

Question 17: If I am interested in light pollution growth in the United States, is there a feature on UNBiodiversity Lab that can help me gather data and information on this topic specifically?

Answer 17: The closest thing available on UN Biodiversity Lab, indirectly, are the Human Footprint datasets, as they include nightlights data to derive various other human pressures. Directly though, there is not direct access to any of the global night light sensing products on UN Biodiversity Lab.

Question 18: Can we check tourism activities like "Trekking corridors" in the mountainous areas?

Answer 18: We do not have such a UN Biodiversity Lab data layer that tracks specific tourism activities in the mountainous areas. However, you can use the Human Footprint to monitor human activities and their impacts in these regions.

Question 19: Any specialized ecosystems map available for the Asia region?

Answer 19: There are not any specialized ecosystem maps for Asia, but it may be worth checking out some of the data from the NASA-supported Forest Integrity Project that is available for Southeast Asia. It provides a few interesting indices on the structural integrity of forests in the moist tropical biomes, that may be of use to identify older, more intact primary forest areas.

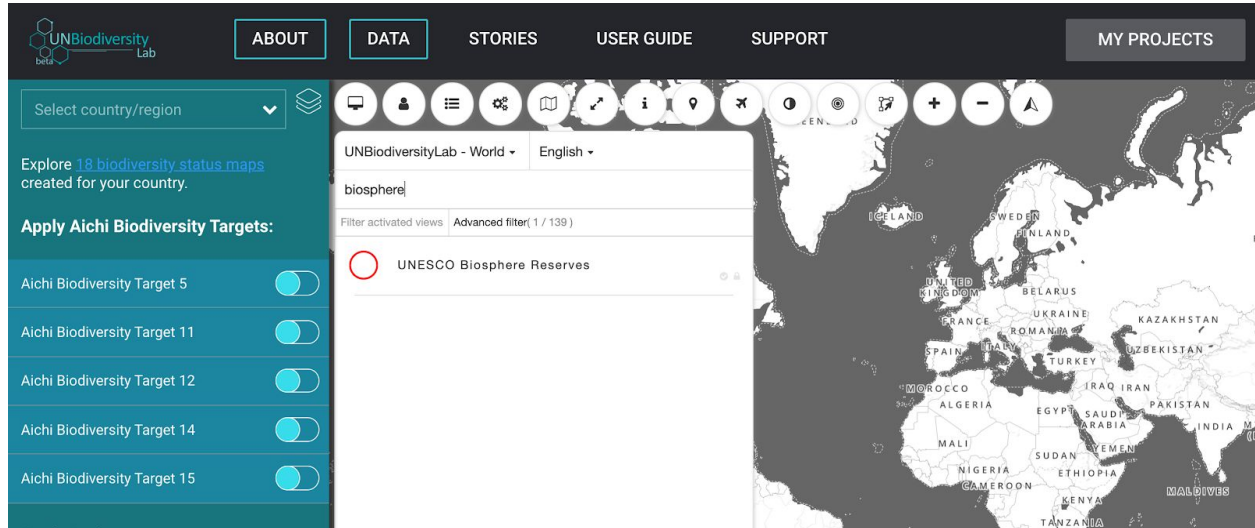
Question 20: Any support in accessing the spatial data of the UNESCO biosphere reserves (e.g. Kafa Biosphere reserve) from the UN Biodiversity Lab?



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Answer 20: You can access this data on UN Biodiversity Lab from the public site. Go to www.unbiodiversitylab.org and use the search bar to find the data layer. You can access it by typing “Biosphere” in the search bar. When you do this, the UNESCO Biosphere Reserves will appear. You can then visualize these data for your chosen country.



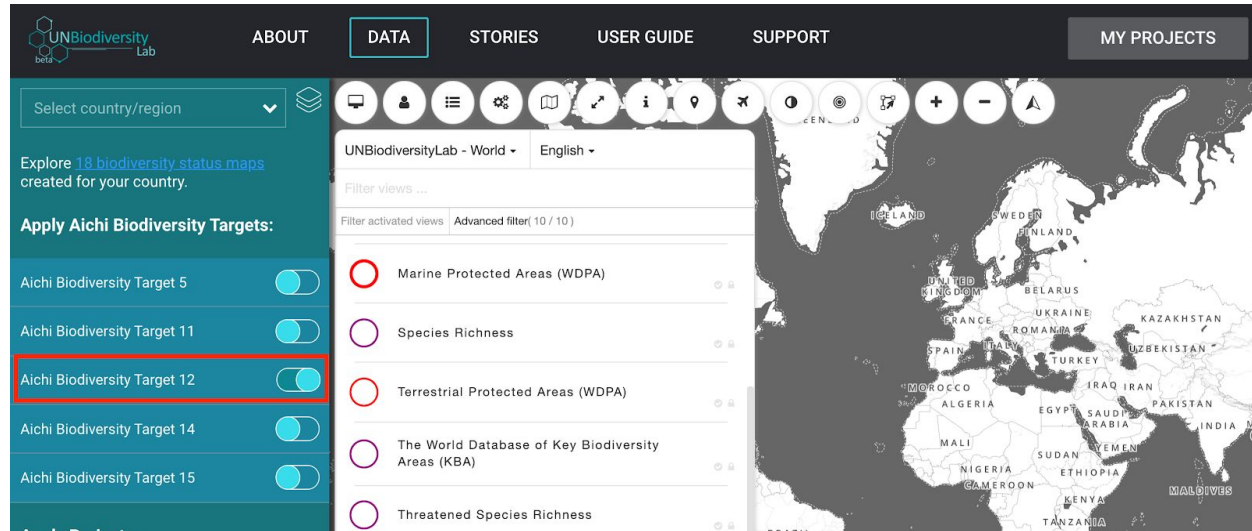
Question 21: How can we use the UN Biodiversity Lab for wildlife conservation? Can we map wildlife species?

Answer 21: You can use UN Biodiversity information in combination with national data such as physical-geographic variables, to support wildlife conservation. This question is closely linked to the Convention on Biological Diversity’s Aichi Biodiversity Target 12 on endangered species. You can use the platform to find several data layers that have links to wildlife conservation. Go to www.unbiodiversitylab.org and click on the button “Aichi Biodiversity Target 12”; the data layers that are useful to achieve this ABT, including “Species Richness” or “Threatened Species Richness”, will be available there.



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Question 22: How remote sensing can help in the safe management of protected areas on the wildlife side (fight against poachers' acts for example)

Answer 22: This is very similar to the previous question. There really isn't much remotely sensed data available on, for example, inhibiting poaching. It is generally too coarse, or too expensive, or not time specific. That said, there are groups using drones to monitor things on the ground in real-time, over more limited areas. I can ask a colleague who works directly in that space for his thoughts.

Question 23: Could you give us more information on the calculation of the indicator on the connectivity of protected areas and could it be modulated according to the nature of ecosystems and landscapes by region?

Answer 23: To obtain the calculation of the Biodiversity Index applied to the biological corridors, information is provided on the number of species that potentially exist in the corridor, according to the type and surface area covered. It is measured from 0 to 1, with 0 being the one with little diversity and the value 1 representing high diversity. This information was developed by the National System of Conservation Areas (SINAC), as part of the results presented in the sixth national report (6NR).

Question 24: How best can the UN Biodiversity Lab assist with riparian vegetation/corridor assessment and its restoration?

Answer 24: Riparian area assessments may typically require higher resolution data than is readily available at the global level, and on UN Biodiversity Lab. However, having said that, two datasets come to mind that may be of use: first, any of the data components of the Global Surface Water Explorer project; and secondly, Global Forest



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Cover data. The former may be able to indicate trends in water extent within riparian zones, while the later may provide some indication of forest cover loss or gain within those areas.

Question 25: How can we differentiate between various types of vegetation?

Answer 25: In some cases NASA remote sensing data can be used to differentiate between broad classes in vegetation, such as agriculture compared to forests. This can be done with a multi-spectral sensor such as Landsat. In order to determine different species (such as invasive species) you will likely need hyperspectral data because the wavelength range of multi-spectral sensors like Landsat are too broad to identify different types of vegetation. Hyperspectral imagers are however not available globally on a standardized repeat basis like Landsat, many of them are onboard planes (airborne), and are “tasked” for specific flights. NASA is currently hoping to develop a satellite-based hyperspectral sensor for the future. We are also considering a hyperspectral ARSET training in the future, so if this of interest, please let us know! Here is some more information on Hyperspectral data:

- AVIRIS: <https://aviris.jpl.nasa.gov/>
- HypIRI: <https://hyspiri.jpl.nasa.gov/>
- Global Hyperspectral agriculture spectral library (via the Land Processes Distributed Active Archive Center (LPDAAC):
<https://lpdaac.usgs.gov/news/release-global-hyperspectral-imaging-spectral-library-agricultural-crops-conterminous-united-states/>

There are a number of ARSET webinars dedicated to vegetation specific analyses such as NDVI (<https://arset.gsfc.nasa.gov/land/webinars/advancedNDVI>) and others. Please go to the ARSET webpage for more details (<https://arset.gsfc.nasa.gov/>).

Question 26: Can we develop an algorithm according to the spectral signature of different crops (after sampling) of different areas and then we might use that in different regions accordingly?

Answer 26: Yes, this is possible. There may be important differences in the spectral signatures of different crops in different locations that would need to be accounted for. You would need to obtain field information with the spectral signatures of crops of interest that you would use for your algorithm. You will also need to consider phenological state, climatic variables, and seasonality in your analysis. For more information, please contact Scott Atkinson (scott.atkinson@undp.org) and Christian Vargas (cvargas@cenat.ac.cr).



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Question 27: How logging concessions are recorded in the database?

Answer 27: This question is related to the Papua New Guinea REDD+ and Forest Monitoring Web Portal. You can access the portal [here](#). The logging concession boundaries are managed by the Papua New Guinea Forest Authority (PNGFA). All the expired and operational concessions are displayed in the portal. Once new concessions are authorized by PNGFA, its boundary will be added.

Question 28: What is the most efficient and widely used sensor for data on water resources?

Answer 28: There are a number of sensors that can be used for water resources assessments including MODIS, VIIRS, Landsat, etc. The answer depends on what component of this broad theme is being assessed or which are the particular research questions. It will also depend on the physical factors of the particular study site including the area, whether the research is related to water quality vs hydrology, etc. One of ARSET's programmatic areas is Water Resources and a number of educational webinars can be found in: <https://arset.gsfc.nasa.gov/water/webinars>.

National Projects on UN Biodiversity Lab

Question 29: Open biodiversity information is generally poorly accessible in Uruguay. Regarding spatial data in Uruguay, how is the state of progress of the National Reports?

Answer 29: Under the 6NR project, Uruguay was a GEF-eligible country and received the support from UNDP team. We mostly worked with representatives from the government and UNDP Country Office Uruguay. The country submitted its 6NR on 31 Dec. 2018 and a more finalized version in Jan. 2019. You can access Uruguay's 6NR [here](#). If you have more specific questions, and are working on biodiversity conservation in the country, please feel free to reach out to Marion Marigo at marion.marigo@undp.org.

Question 30: I would like to know where Argentina is in the generation of programs and projects on biodiversity.

Answer 30: Under the 6NR project, Argentina was a GEF-eligible country and received the support of UNDP. Argentina also successfully submitted its 6NR to CBD in 2019. Therefore, there is already a private project on UN Biodiversity Lab for the country -



feel free to contact Annie Virnig at anne.virnig@undp.org if you have more specific questions.

Use of spatial data in Costa Rica

Question 31: How do you assign a value to an intangible good such as ecosystem services to a monetary value?

Answer 31: In Costa Rica we are working to improve the way we value ecosystem services. As explained in the presentation, this is one of the challenges that we have identified, on which we have prioritized our work in the short term. The implementation of the methodology of the environmental account of ecosystem services developed within the framework of the United Nations System of Environmental and Economic Accounting.

There are also other projects we are currently working on related to the valuation of ecosystem services. At the national level, we are working to improve the methodology used in the framework of the payment for environmental services program, to include other environmental services in the incentive scheme. And internationally we are working with Stanford University and the Natural Capital Project on a project that seeks to improve the modeling of ecosystem services through earth observation.

Question 32: In the case of Costa Rica, are other key economic and social sectors being considered in the definition of public policies for environmental conservation, protection and restoration?

Answer 32: Yes! Economic and social variables are necessarily taken into account in the elaboration of public conservation policies in Costa Rica. For this I am going to refer to two examples. The first is the one we share about the Great Enchilada Project, in which one of the components that we take into account for the analysis is related to the ecosystem services that nature provides in relation to sources of employment and livelihoods. The other example is related to the National REDD+ strategy, for reducing emissions from deforestation and forest degradation, for which social variables such as socioeconomic status and gender are taken into account in the identification of priorities and the implementation of this strategy.

Question 33: What are the types of productive landscapes that can be mapped, for example, in a country like Costa Rica?



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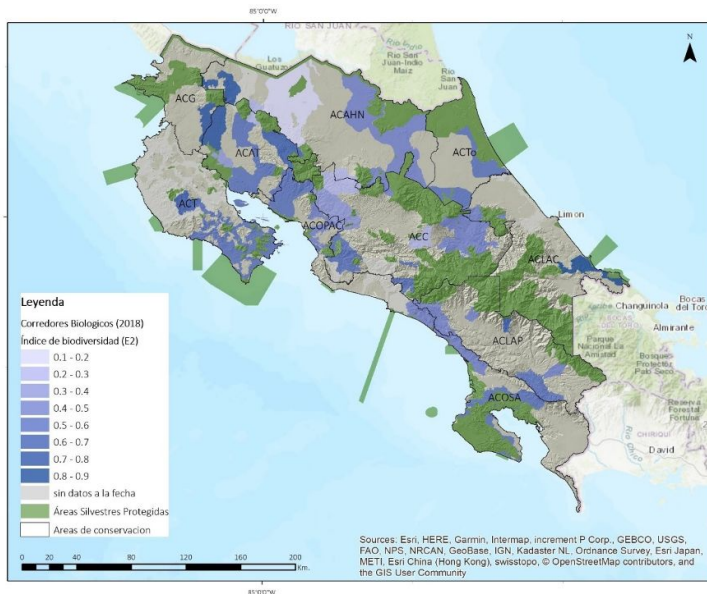
Answer 33: Intensive productive landscapes such as pineapple, palm oil, and grass are currently being mapped. However, other productive landscapes such as banana-plantain, rice, coffee, sugar cane among others can be included. For each one of them, extensions of more than 40 thousand hectares distributed within the national territory are considered.

Question 34: Can you provide more details (or literature) about the methodology of the national diversity index for Costa Rica?

Answer 34: Biodiversity Intactness Index is the modeled average abundance of species originally present, relative to their abundance in an intact ecosystem. You can see the publication on this here:

Tim Newbold; Lawrence N Hudson; Andrew P Arnell; Sara Contu et al. (2016). Dataset: Global map of the Biodiversity Intactness Index, from Newbold et al. (2016) Science. Natural History Museum Data Portal (data.nhm.ac.uk). <https://doi.org/10.5519/0009936>

You can find the information on this map in the publication of the Sixth National Report of Costa Rica to the Convention of Biological Diversity and the State of Biodiversity of Costa Rica 2014-2018. These resources are available [here](#).



Question 35: I developed a platform based on the manual management of the flow of visitation in protected wild areas and national parks of SINAC, could both platforms be linked with both tools for national use in Costa Rica?



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Answer 35: Thank you very much for letting us know this information. Yes, they can be linked. Please contact Rafael Monge (rmonge@minae.go.cr) and Christian Vargas (cvargas@cenat.ac.cr) to discuss further.

Question 36: Can you provide the links of the biodiversity work of Costa Rica?

Answer 36: In the [link](#) provided, you can find the biodiversity documentation for Costa Rica that resulted in the following documents: the VI Report of Costa Rica to the 2014-2018 Convention on Biological Diversity (6IN), and the State of Biodiversity 2014-2018.

Question 37: For the MOCUPP tool shared by Costa Rica, when grazing areas are displayed is this classification automatically generated by the system or is it a map created beforehand?

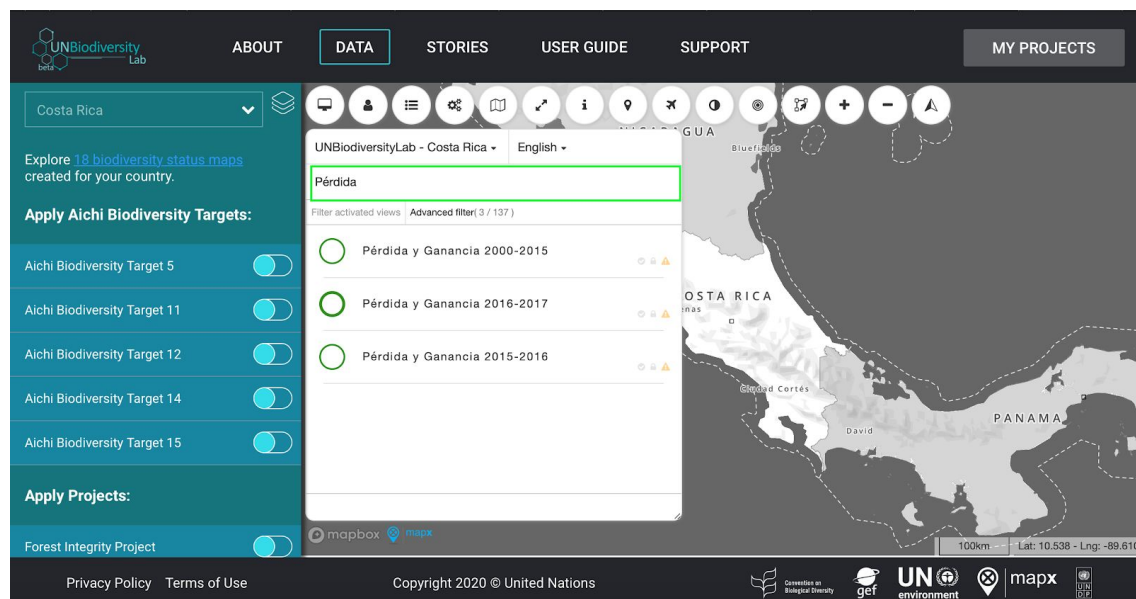
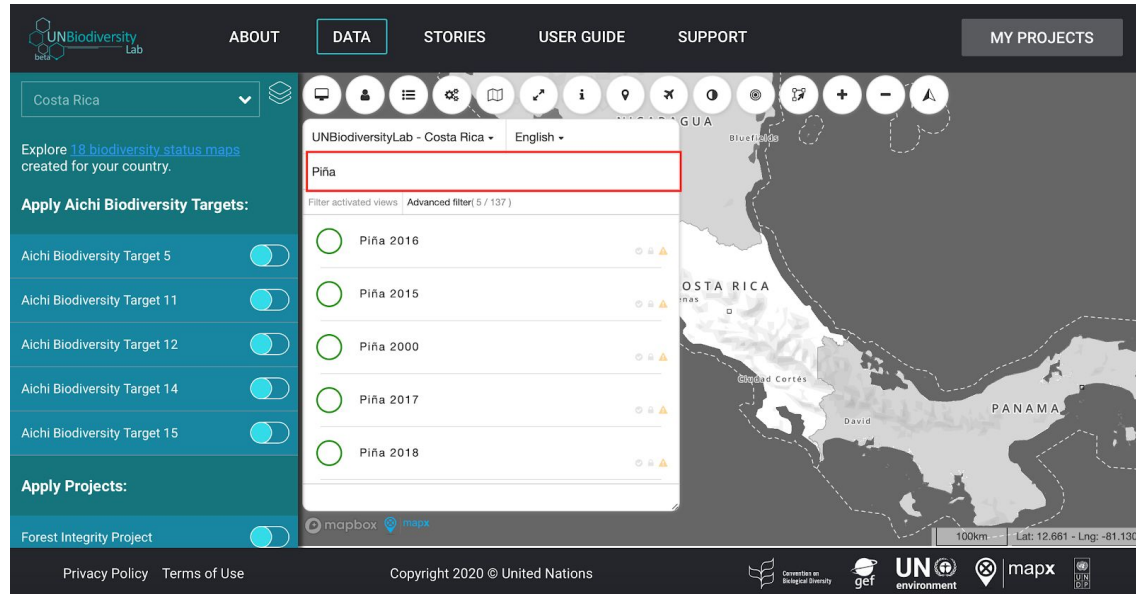
Answer 37: The map is created beforehand. With the [MOCUPP](#) tool, we are monitoring three productive landscapes: pineapple, oil palm, and pastures. The tool monitors pasture polygons that have less than 30% of forest coverage. This means that it includes not only deforested, 'clean' pastures, but also pastures that have some trees in them (up to 30% coverage).

These layers are available for visualization and download from the UN Biodiversity Lab. Simply search for 'Pérdida y Ganancia' (Loss and Gain) or 'Piña' (Pineapple) in the search bar.



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It is also available directly in the [MOCUPP](#) tool as well as on Costa Rica's [SIMOCUTE](#) platform. Direct links to download the layers :

- Palms:
 - WMS: <http://monitoreo.prias.cenat.ac.cr/geoserver/MonitoreoPalma/wms>
- Pineapple:
 - WMS: <http://monitoreo.prias.cenat.ac.cr/geoserver/MonitoreoPina/wms>
 - WFS: <http://monitoreo.prias.cenat.ac.cr/geoserver/MonitoreoPina/wfs>



- Pastures:
 - <http://monitoreo.prias.cenat.ac.cr/geoserver/MonitoreoPastos/wms>

Use of spatial data in Colombia

Question 38: What is the biggest challenge that keeps you from keeping the maps and the information with an updated temporal resolution?

Answer 38: Mainly it is the standardization of methods and the articulation between institutions. When the information is generated nationally, the efforts are very heterogeneous for each institution, applying the standards differently, and this may generate some inconsistencies that limit comparisons at a temporal level. On the other hand, the data that comes from foreign entities often does not have the necessary time frame for it to be used for monitoring in Colombia.

Question 39: Do we have to wait for these projects to be published to have access?

Answer 39: It is about the Human footprint for Colombia, it is necessary to wait for it to be published so it can be used. This will occur this year.

Question 40: Are there opportunities for internships or university-sponsored internships with the Humboldt Institute?

Answer 40: Yes, you can do internships. For that it is necessary to contact cmvilla@humboldt.org.co; Claudia Villa is in charge of academic mobility and she can give more details.

Question 41: Did you use Landsat images for Colombia's forest fragmentation maps?

Answer 41: If the fragmentation maps are based on coverage maps developed by Matt Hansen's lab at the University of Maryland. These maps mainly use Landsat images.

Question 42: What is being done to translate the technical analyses carried out by the Humboldt Institute into language that is understandable to decision-makers and to the general public?

Answer 42: The Institute has several outlets to support decision making. On the one hand, there are publications aimed at decision makers (State Reports and Trends in Biodiversity) as well as their institutional magazine (Biodiversity in Practice). The Biotablero project is another example where there is a translation of knowledge thinking about decision makers. On the other hand, because it is an official Institute,



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Humboldt has a presence at national thematic tables where the translation exercise is more direct.

Question 43: With the forest fires that have been registered in the recent months, what strategies could be approached with your project?

Answer 43: The management of forest fires once they occur is not the responsibility of the Humboldt Institute, this corresponds more locally to the environment secretariats, regional corporations, and the risk management institute. However, from an ecological point of view, the institute has fostered a dialogue on how we relate to fires and how we can modify land management to create human communities resilient to accidents related to forest fires. In the report on the status and trend of biodiversity published in 2018 there is an analysis and a reflection on it. You can check it [here](#).

Question 44: From slide 71, what is the difference between essential variable and indicator? What has been developed for functional diversity and for ecosystem services?

Answer 44: An essential variable is an attribute of a biological community, for example population size. An indicator goes further and translates that variable in the response to a process. For example, the number of endangered species indicates the intensity of impact and the vulnerability of the species to the conditions of their habitat. The indicator is used to make decisions.

Question 45: How can our entity, in Colombia, access a project to evaluate these projects?

Answer 45: If the question is related to projects in which the Humboldt participates, the best way is to contact Susana Rodríguez who can give them the most specific information (drodriguez@humboldt.org.co).

Question 46: How are the results obtained for territorial planning and the definition of territorial planning and fiscal strengthening policies incorporated?

Answer 46: The projects carried out by Humboldt Institute usually imply management recommendations either at the national, regional or local level. However, at the regional or local level the final decisions usually depend on municipal governors and authorities and it is through municipal or basin level instruments (POT, POMCA).

Question 47: How can a species "x" be identified in a megadiverse country like Colombia if it is migratory or uses the territory only to pass through?



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Answer 47: In the case of the most monitored species for these types of questions, which are birds, this is done with ringing standards in each country. Individuals of a migratory species when they arrive in Colombia usually have rings that identify them as species from other latitudes. Once a species is known to be migratory, its monitoring can be done with traditional techniques, making annual counts during the migratory season.

Question 48: Many of the village aqueducts are run by the communities. One of the principles of sustainability is the care of ecosystems. Is it feasible to use the tools mentioned for example in Colombia to be able to use them and organize critical sites of these aqueducts with the communities? If not, is it feasible to link them to these processes to still improve the conditions of water and environment?

Answer 48: Yes, it is possible to use the available information to characterize and identify the sites of interest in each locality, however it is important to keep in mind that the scale of many global products is not appropriate for exercises that are too local.

Question 49: Is there data on precipitation evaporation in the Choco Esmeraldas area and the Ecuador-Colombia border?

Answer 49: For Colombia you can consult the IDEAM or the climate data contained in the UN Biodiversity Lab.

Question 50: How is the defragmentation analysis done? Are we using some simulation? Or is it an algorithm from the sensor? This is in reference to the nationwide characterization of dry tropical forest degradation.

Answer 50: The data comes directly from the NASA Forest Integrity Project, and is available on UN Biodiversity Lab. This analysis was conducted by Patrick Jantz and Scott Goetz from Northern Arizona University. Using forest cover information (derived from remote sensing), they applied a method called Morphological Spatial Pattern Analysis, which basically classifies each pixel according to its geometrical position in the landscape. For example, pixels could be “core”, if they are inside a forest patch and are completely surrounded by forest, or they could be “edges” if they are at the border of the forest. The categories could be interpreted as categories reflecting fragmentation. For more information on the NASA Forest Integrity Project, see the project brochure in [English](#), [French](#), and [Spanish](#).

As these maps were produced for 2000 and 2013, we could estimate increase or decrease in fragmentation by using the change in category for each pixel. For the



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characterization of dry tropical forest degradation, this variable (fragmentation dynamics) was just one of the variables included in the cluster analysis conducted to explore categories of forest degradation. Clusters were presented as colored groups in the resulting map.

Question 51: In this slide of forest change climatic differences, what is the SI unit of legend used? Is it degree of change?

Answer 51: The slide shows the clusters identified by the hierarchical clustering algorithm. It identified 4 clusters and the location of those clusters closely match the natural region in Colombia. For example, the red cluster (cluster # 2) identified with only climatic variables is all located along the eastern plains in a natural region called Orinoquia.

Question 52: Is Biotablero available in English language?

Answer 52: It is only available in Spanish at this time. You can access it at <http://biotablero.humboldt.org.co>.

Question 53: What is the “Wallace Biodiversity Modeling software” used by Mary Blair?

Answer 53: Wallace is an initiative led by the National Museum of Natural History developed by Mary Blair among others. It is a species distribution modeling software, freely available with the R Shiny platform. The idea is that users can design their own models using scientifically validated tools, modifying them at will but keeping track of the work so it could be reproducible. The difference between Wallace and Biomodelos is that Biomodelos works in collaboration with species experts to validate maps produced by modelling algorithms (like the ones produced by Wallace). The current project wants to make both platforms interoperable. The tools within Wallace are designed to be available to conservation practitioners. Access more information on Wallace [here](#).

Question 54: Are projects of this type being worked around Bolívar and Sucre, Colombia?

Answer 54: Yes, the dry forest projects have areas of influence in Bolívar and Sucre. The Humboldt has historically had projects in both departments.

Question 55: Does the Biotablero only include terrestrial ecosystems or also marine and freshwater?



Answer 55: Depends on the indicator, for now we focus on continental ecosystems.

Question 56: What must be done to have access to the biotablero modules?

Answer 56: You must register as a user on the biotablero page, depending on their role they will have access to some platform functions.

Question 57: From slide 61, please if you can explain the graphics a little better. I understand that it is an analysis of order according to transformation and biological group, but the interpretation by group and the total is not clear to me.

Answer 57: Yes, a management analysis is correct. Each point is a sampling site where the biological community of birds, ants, vegetation, and trap cameras were characterized. The management is carried out on the presence and abundance data for the communities and they are classified once ordered by forest change levels defined a priori with secondary information.

Question 58: Are there documents to know the different projects that the Humboldt Institute commented on, especially the one referring to fragmentation of tropical dry forest?

Answer 58: From the [Humboldt website](#) you can access the Institute's document repository where you can consult the different projects. Currently the website does not present detailed information on each of the projects.

Use of spatial data in the Sixth National Reports to the Convention on Biological Diversity

Question 59: What are the Aichi Biodiversity Targets?

Answer 59: In 2010, the Tenth meeting of the Conference of the Parties to the Convention of Biodiversity (CBD COP10), held in Nagoya, Aichi Prefecture, Japan, adopted a revised and updated Strategic Plan for Biodiversity, including the Aichi Biodiversity Targets, for the period 2011-2020.

This Strategic Plan provides a general framework on biodiversity, not only for biodiversity-related conventions, but for the entire United Nations system and all other partners involved in biodiversity management and policy development. The Aichi Biodiversity Targets are a set of 20 global targets that were intended to be translated into national priorities by the Parties to the Convention on Biological Diversity. Each of



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the objectives focuses on a specific aspect of biodiversity, such as the protection of habitats (ABT 5), protected areas (ABT 11), access and benefit sharing (ABT 16), etc. You can find all the information on the [CBD website](#) and especially [here](#).

Question 60: Do you know which maps were most common in the Sixth National Reports amongst all countries?

Response 60: If we look specifically at maps in the Sixth National Reports, countries most commonly included potentially actionable maps on Key Biodiversity Areas (365) and Protected Areas (294). They also used actionable maps showing the intersection of Protected Areas and Key Biodiversity Areas quite frequently (206). Other frequent categories included maps on land cover / land cover change (185), and policy and management (182).

Question 61: What recommendations can you provide for countries that do not yet have the corresponding studies or maps on biodiversity? Where should we start?

Answer 61: Many of the countries UNDP and UN Environment Programme supported to prepare their Sixth National Reports to the Convention on Biological Diversity were in a similar position. We created 18 draft status maps that could help them report on the status of biodiversity in their country, focusing on five key Aichi Biodiversity Targets (ABTs 5, 11, 12, 14, and 15).

You can explore the draft status maps on NBSAP Forum [here](#). You can also access our technical guidance on how these maps were prepared in [English](#) | [French](#) | [Spanish](#).

We are also happy to suggest data available from the UN Biodiversity Lab that might be particularly useful for your country's national priorities. Please don't hesitate to reach out to Scott Atkinson (scott.atkinson@undp.org) with any questions.

Question 62: Could you provide a link to your study on uptake of spatial information by countries?

Answer 62: We launched this analysis in November 2019 during the Twenty-third Meeting of the Subsidiary Body on Scientific, Technical and Technological Advice to the Convention on Biological Diversity (CBD SBSTTA 23). You can find the results in *Nature is Counting on Us: Mapping Progress to Achieve the Convention on Biological Diversity*, accessible [here](#).



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Please note that our team is still in the process of analyzing Sixth National Reports (6NRs) that have been submitted to CBD between November 2019 and now. We aim to release a third and last version of the analysis by August 2020.

Question 63: What is the difference between actionable and non-actionable maps? Which one would you recommend? Are there any cases/ circumstances where one is better than the other?

Answer 63: You can see our definitions of non-actionable, potentially actionable, and actionable maps below. Actionable maps provide the best information for policymakers and planners to take action.

Taxonomy of Maps	Type	Example
Non-actionable. Maps that are unlikely to be useful in isolation, or when combined with other data layers, to take action for nature, climate, and people. (Figure 1a).	Administrative regions	Political region or district, national boundary, political map
	Basic geographic variable or feature	Geological history map, location map of country, mountains, physiographic map, precipitation, slope, temperature, topography, volcano
Potentially actionable. Maps that have the potential to guide action for nature, climate, and people when these data layers are combined with other data layers to yield new information. For example, maps of key biodiversity areas and unprotected lands could be overlaid to determine locations	Corridors, buffers	Biological corridors, buffer zones
	Ecosystem services	Hazards, wetland contributions to fisheries, water services
	Habitat and habitat intactness	Habitat extent (e.g. coral reefs, mangroves, sea grass beds), phytogeography, vegetation
	Hydrology, water quality	Hydrological map, watershed map
	Invasive alien species	Invasive alien species distribution
	Key biodiversity areas	Biodiversity hotspots, endemism, important bird areas, important plant areas, species richness



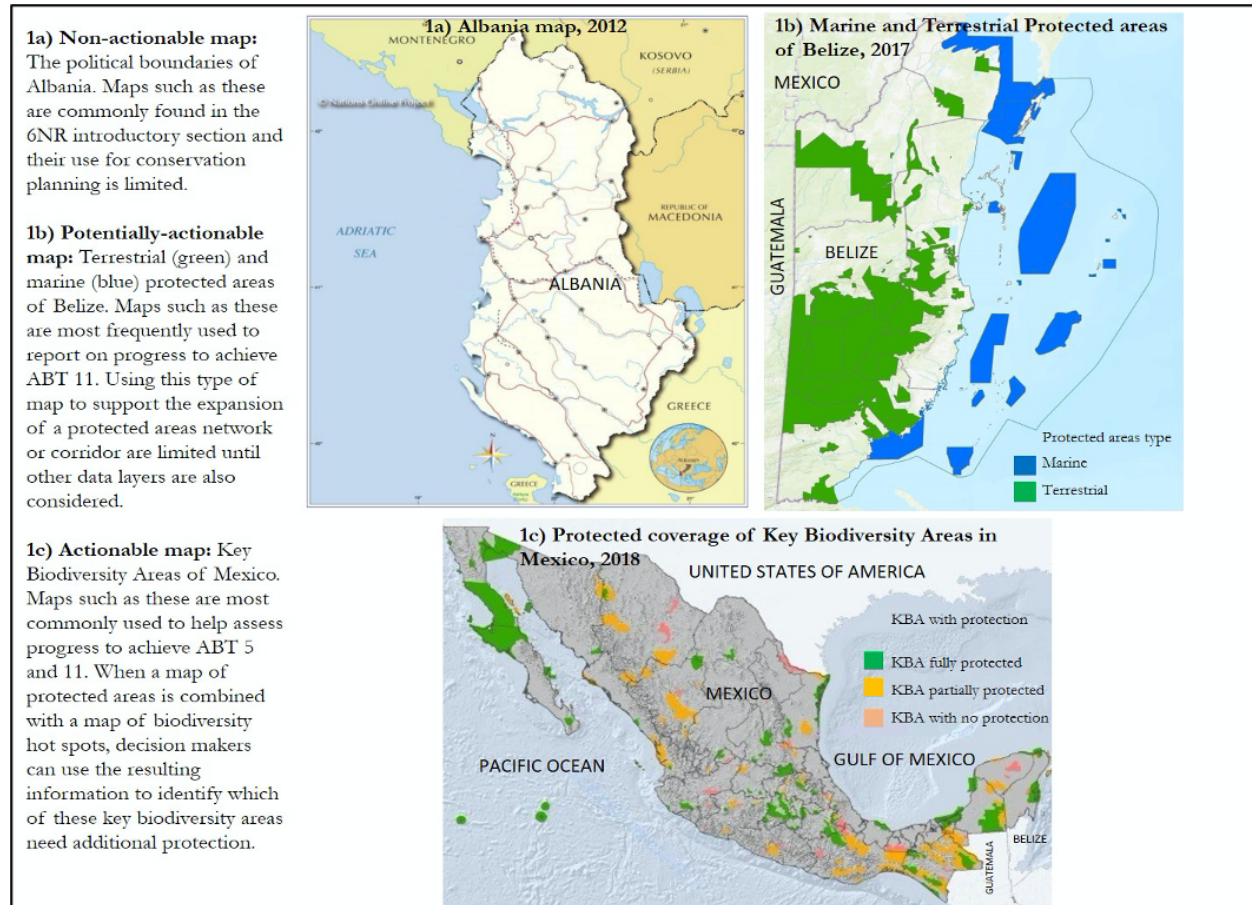
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to for new PAs (Figure 1b).	Land cover/landcover change	Biogeographic data, forest cover change, land cover, forest fires
	Land use/land use change/intensity	Land use (e.g. forest and agriculture), land use change, cattle distribution maps, coffee productivity, potential agricultural productivity
	Policy and management	Forest management units, conservation units, sustainable development actions
	Protected areas (PA)	PA extent, PA network, Ramsar sites, World Heritage sites
	Regions, zones	Ocean/terrestrial ecoregion, ecosystem map, biosphere reserve
	Socio-economic	Population density and distribution
Actionable. Maps that provide information that allowed planners to take action. (Figure 1c).	Climate change vulnerability	Disaster risk areas, sea-level rise
	Future footprint	Mining concessions, timber concessions
	Proposed buffer zones	Proposed buffer zones
	Proposed PAs	Proposed PAs and PA systems
	Protected areas and biodiversity	PA and key biodiversity areas; PAs and ecoregions; biodiversity and proposed new PAs



Figure 1. Example of the types of non-actionable, potentially actionable, and actionable maps used in 6NRs.



Mapping indigenous lands, emerging infectious diseases, and the Sustainable Development Goals

Question 64: How do Colombia, Costa Rica, and UNDP map indigenous territory?

Answer 64: In **Costa Rica**, the National Institute of Rural Development generated the layer of Costa Rica's indigenous territories we showed in our presentation. They work with the indigenous communities to prepare this information. We can provide more details if required.

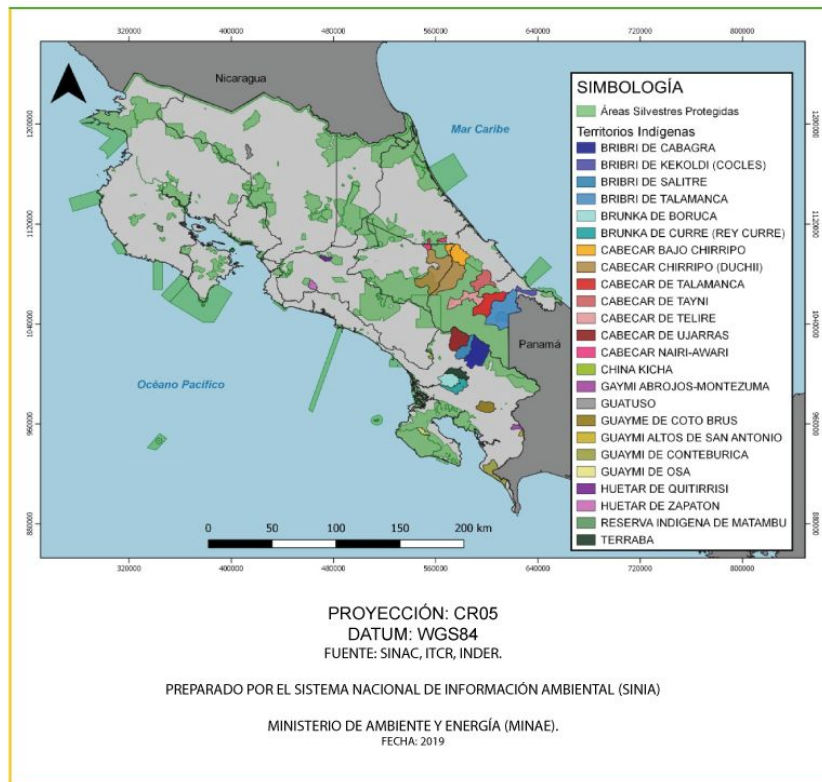


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In **Colombia**, the Agustin Codazzi National Geographic Institute (IGAC) provides official maps of areas with collective rights (Indigenous, afrocolombian communities).

Territorios indígenas de Costa Rica, 2014



From **UNDP's** side, we recognize that there is a lot of amazing indigenous-led work going on to map traditional lands and resources, such as that supported by [Digital Democracy](#) in many different countries or by [ALDEA](#) in Ecuador. World Resource Institute's [Landmark](#) platform also provides indicative mapping of indigenous lands.

There are two important aspects of this work to us. First, we believe that it is essential to spatially document the role indigenous people and local communities play in conserving, restoring, and sustainably managing nature. We want to make sure these efforts are recognized in international policy processes such as the Convention on Biological Diversity and by their own governments. Second, we feel it is essential to support communities to map their lands and traditional knowledge, whether to



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enhance their work to obtain land tenure or to strengthen documentation of ecological knowledge.

We are working with the World Wide Fund for Nature (WWF), World Resources Institute (WRI), the ICCA Consortium, UN Environment World Conservation Monitoring Centre, and representatives from indigenous groups to globally map indigenous lands and demonstrate how their management contributes to the objectives of the CBD. To address the second, we are starting to explore with various indigenous groups how the private project space on UN Biodiversity Lab could enable them to consolidate all their spatial data in a central repository and choose what they would like to share publicly.

Question 65: How are alternative livelihoods, such as areas participating in Non-timber Forest Products (NTFPs) and Community-based Natural Resources Management (CBNRM) being encompassed in mapping exercises? As these are also critical to biodiversity conservation and human well-being?

Answer 65: See the previous question for some explorations of how these concepts are being documented. In addition, inside **Humboldt Institute** in **Colombia** there are several efforts to do exactly this, but a complete characterization and comparison of alternative land management practices requires a good characterization of its impact on biodiversity and this can not be done only using remote sensing information.

A top-down approach to the problem is to explore the relationship between different land management and forest characteristics that could be seen from remote sensing (Forest Integrity Index, loss of forest cover, changes in forest connectivity etc), but this requires having time-series data on the same area or a space-for-time approach with areas of contrasting land managements. To complete the picture, a bottom-up approach should gather information about management practices from local communities (intensity of NTFP extraction, species involved, type of collective land management agreements) to characterize intensity and frequency of forest transformation. At Humboldt we have conducted some analyses using the first approach by comparing forest attribute from remote sensing data in and outside of indigenous territories. In general, due to the low levels of forest use, forest inside indigenous territories have better forest attributes than areas outside. The last and most complicated part is to match land management practices with biodiversity response. This usually requires intense field campaigns to characterize biological communities.



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Question 66: I'm curious to learn if there will be efforts to study biodiversity related to the impact of the COVID-19 outbreak. I'd think that the change of human activity conditions in such a global manner would provide an interesting dataset and potential to learn something new. Air pollution is obvious, but what about other factors?

Answer 66: In **Costa Rica**, we have started to think about this question. For now, we are compiling questions about the impact of COVID-19 in different environmental variables and finding possible ways to study them with the available data. Please contact Rafael Monge (rmonge@minae.go.cr) and Christian Vargas (cvargas@cenat.ac.cr) to learn more.

At **UNDP**, this is something that we have had several discussions about over the past few weeks. While we are currently seeing the impacts of an established pandemic on medical infrastructure and its frontline health workers, the critical stage for avoiding and intercepting the transmission of disease from animals to humans -- zoonosis -- is at the interface of human interactions with the natural environment. This is most acute in locations of rapid land use change.

A preliminary risk map for global hotspots of potential future Emerging Infectious Disease (EID) has recently become available -- access it online [here](#). This work has identified at risk locations for zoonosis as those with intact evergreen broadleaf forests, low population density, increasing temperature and rainfall, and a high richness in vertebrate species.

UNDP is working with Oscar Venter (University of Northern British Columbia), James Watson (University of Queensland & Wildlife Conservation Society), and UNDP teams focused on health and crisis relief to see how we can strengthen this initial study. Our goal is to share the results with governments and in-country partners to transform our approaches to mitigating future outbreaks. If you are interested in this work, please contact Annie Virnig (anne.virnig@undp.org).

Question 67: Are there any UNDP plans to make data available for other SDGs?

Answer 67: We are continuously working to make new data available on biodiversity and sustainable development for our users. UNDP also has a desire to make the UN Biodiversity Lab an institutional resource, which would broaden its focus from being nature-based to include additional datasets that relate to human well-being.



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With colleagues across UNDP, we are also exploring how we can create one or more indices that could place an environmental lens on the Human Development Index (HDI). We are considering how we could develop an overarching question to frame the index, such as - “degree to which the extent of changes in natural capital enables countries to achieve key nature-dependent SDGs”. This is still an early discussion, but something we are excited to explore further

The HDI is a highly influential report read around the world – see [here](#) for an overview of the indices by country, and [here](#) to download the 2019 full report.

Question 68: I would like to know more about the concept of Essential Life Support Areas. Where has it been developed and would it be possible to extend it to areas outside the pilot countries?

Answer 68: We are working with Colombia, Kazakhstan, Peru and Uganda, in addition to Costa Rica, on this project. For now, we are intentionally keeping the number of pilots relatively small to ensure we can come up with a robust methodology, and ensure we are flexible enough to take into account countries' national priorities. We hope to scale this project up to additional countries in the coming year. If you work for the government or UNDP, and are interested in being considered in the scale-up of the project, please contact Annie Virnig (anne.virnig@undp.org).

You can access the project brochure [here](#) and the report from the inception workshop in Costa Rica [here](#).